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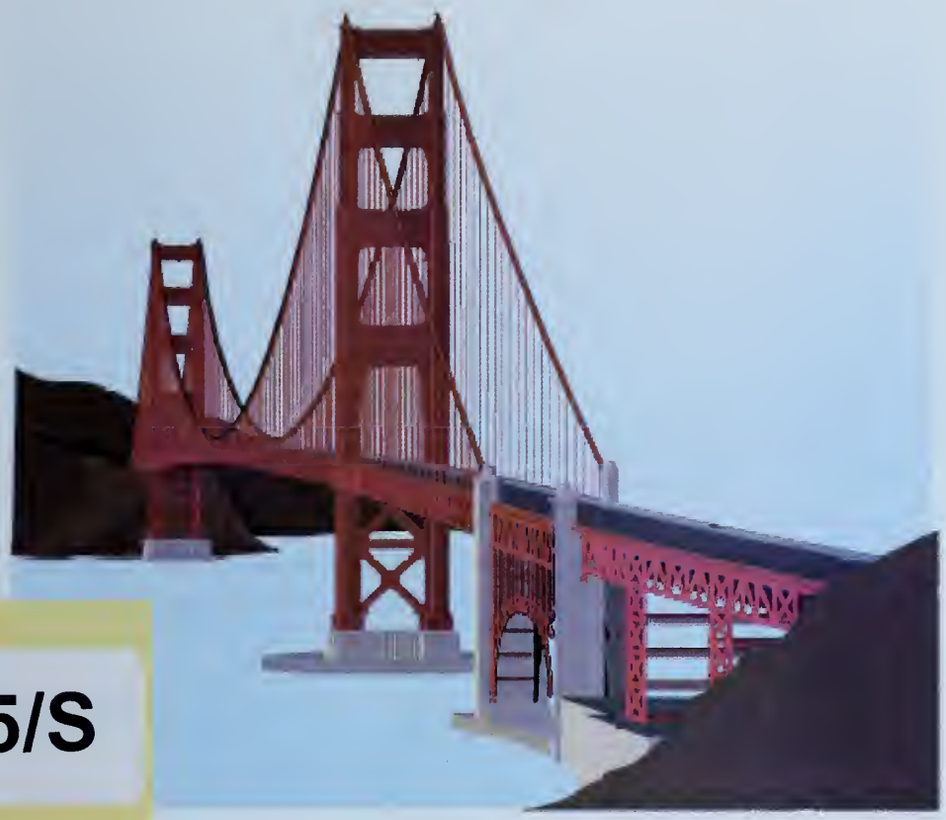

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Francisco, California USA 1993-1999

R*, McFarland W*, Kellogg T*, Kim A*,
Bock S‡, Martin, R†

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Use of Geographic Information System Technology for HIV Prevention Planning, Evaluation and Surveillance San Francisco, California USA 1993-1999

Kohn R*, McFarland W*, Kellogg T*, Kim A*,
Bock S‡, Martin, R†

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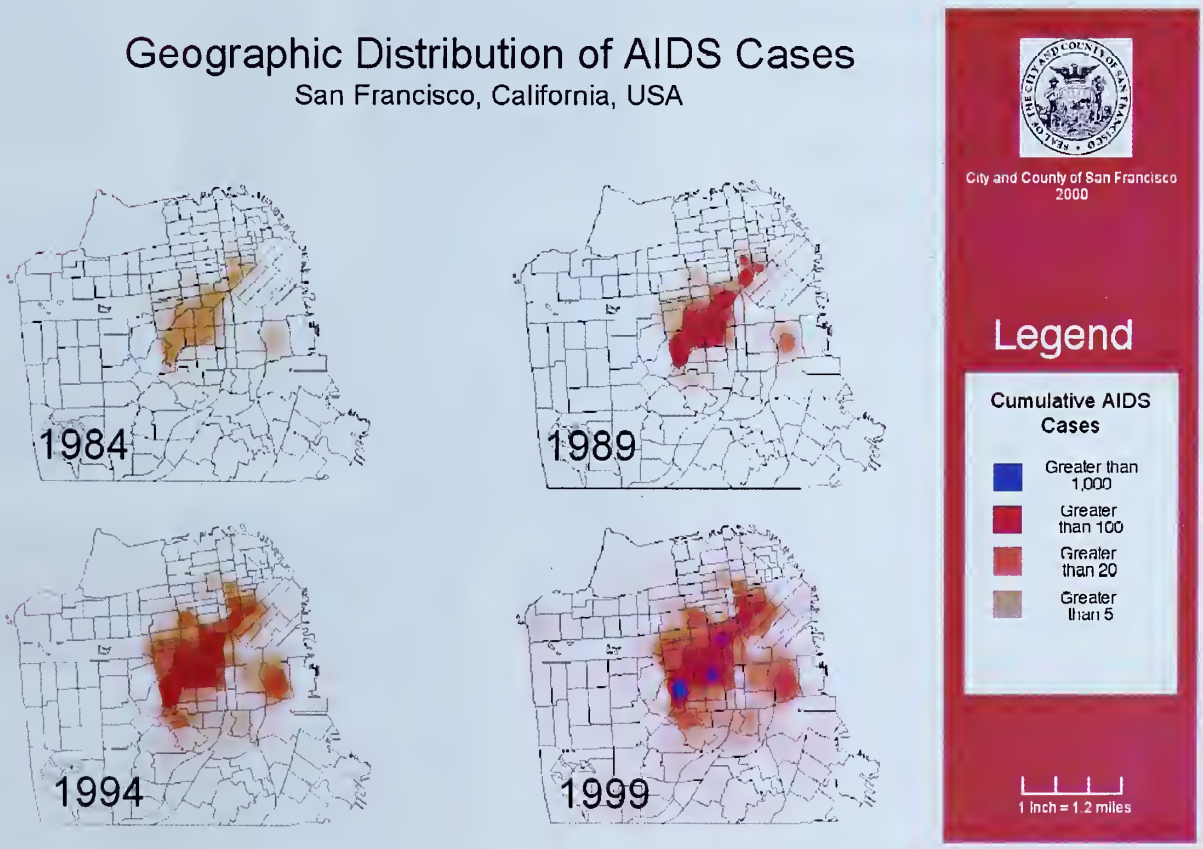
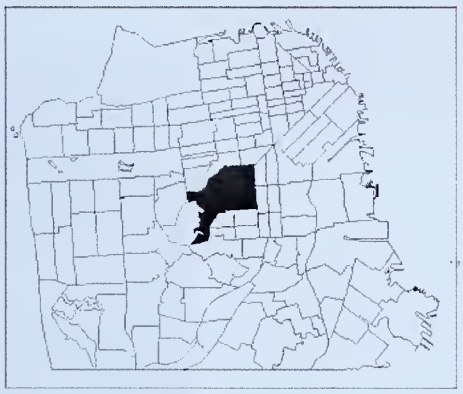
Background and Objectives

- Geographic Information Systems (GIS) technology makes it feasible for local health jurisdictions to closely track the HIV epidemic in well-defined geographic areas
- Precise, local mapping of AIDS cases, HIV infection, and related risk factors can:
  - provide demographic and environmental perspective on the current status of the epidemic,
  - portray historical and long-term trends,
  - evaluate the delivery and impact of prevention and care services,
  - test hypotheses on the social, political, and environmental determinates of transmission,
  - guide population-based epidemiological surveys
  - target outreach efforts to locations where transmission is likely to be highest
- We present several thematic maps of AIDS prevalence to illustrate public health applications of GIS technology



Neighborhood Profile: The Castro

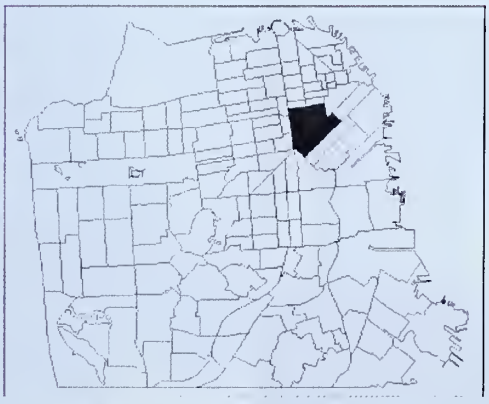
Total population:	24,666
Race/ethnicity*:	
White	85%
African American	4%
Asian	10%
% high school graduate	94%
Median annual income:	$59,262



*Latinos are of any race

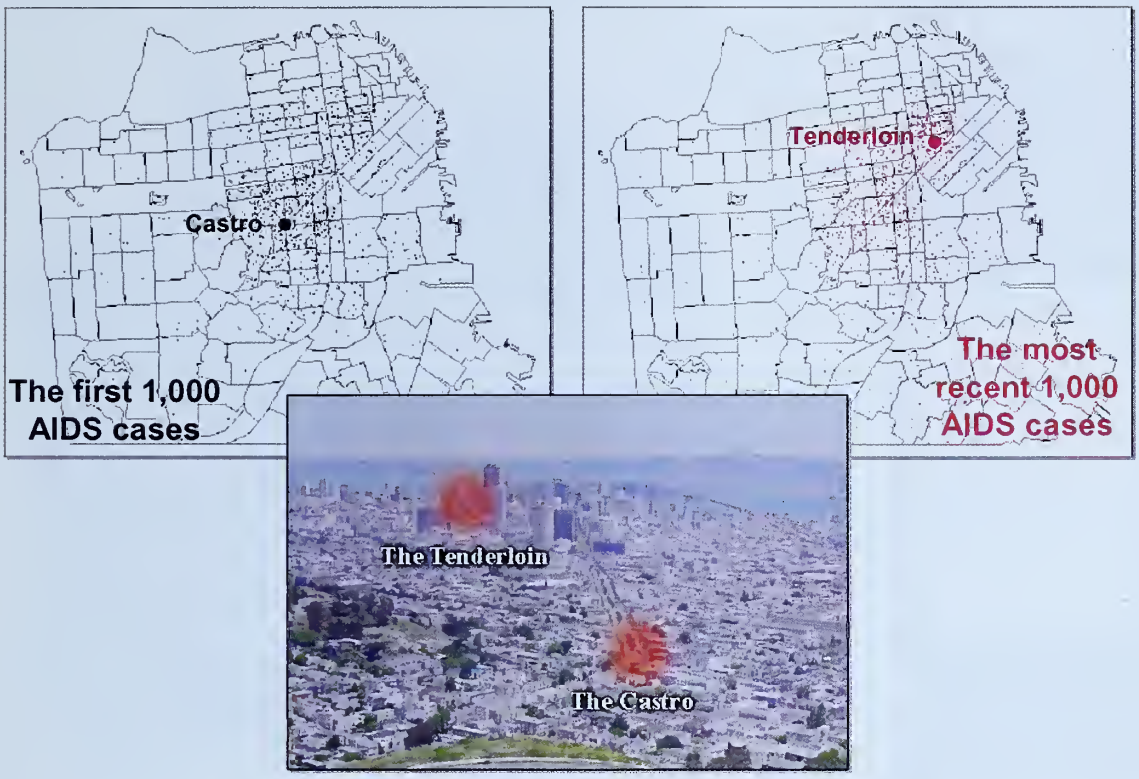
Neighborhood Profile: The Tenderloin

Total population:	28,518
Race/ethnicity*:	
White:	45%
African American	13%
Asian:	41%
% high school graduate	67%
Median annual income:	$21,154

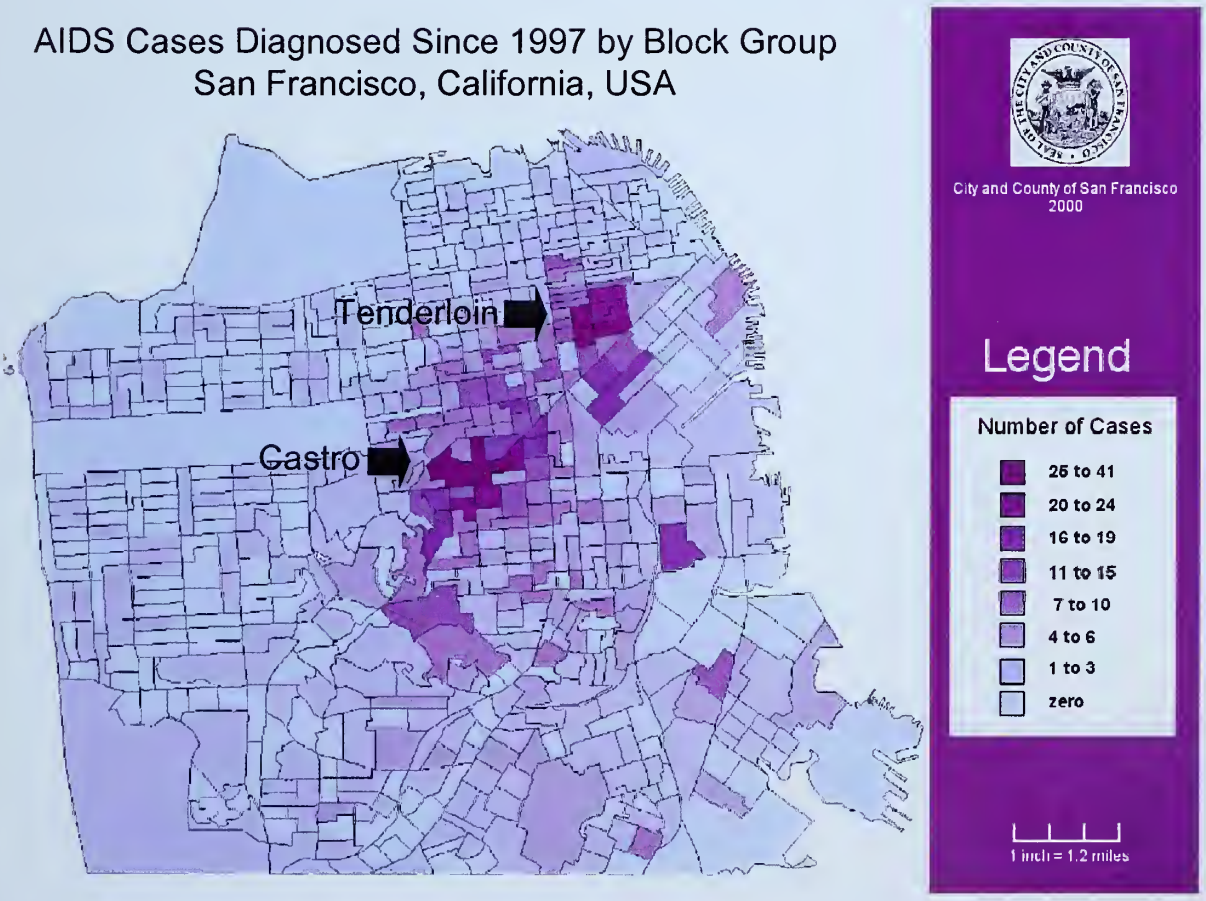


*Latinos are of any race

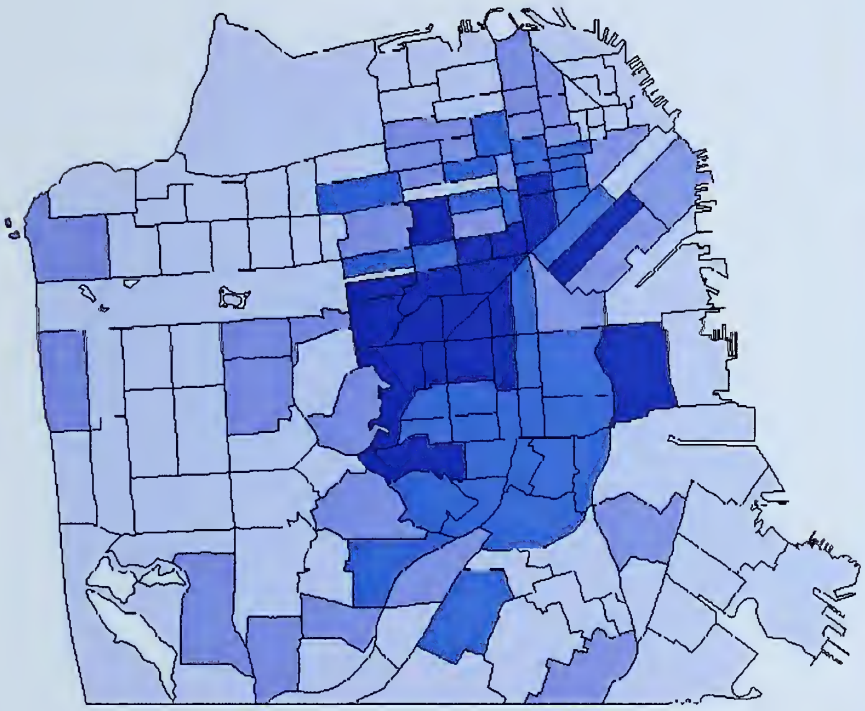
Two Geographic Centers of the HIV/AIDS Epidemic, San Francisco



AIDS Cases Diagnosed Since 1997 by Block Group
San Francisco, California, USA



Distribution of Living AIDS Cases Among Men Who Have Sex With Men



City and County of San Francisco
2000

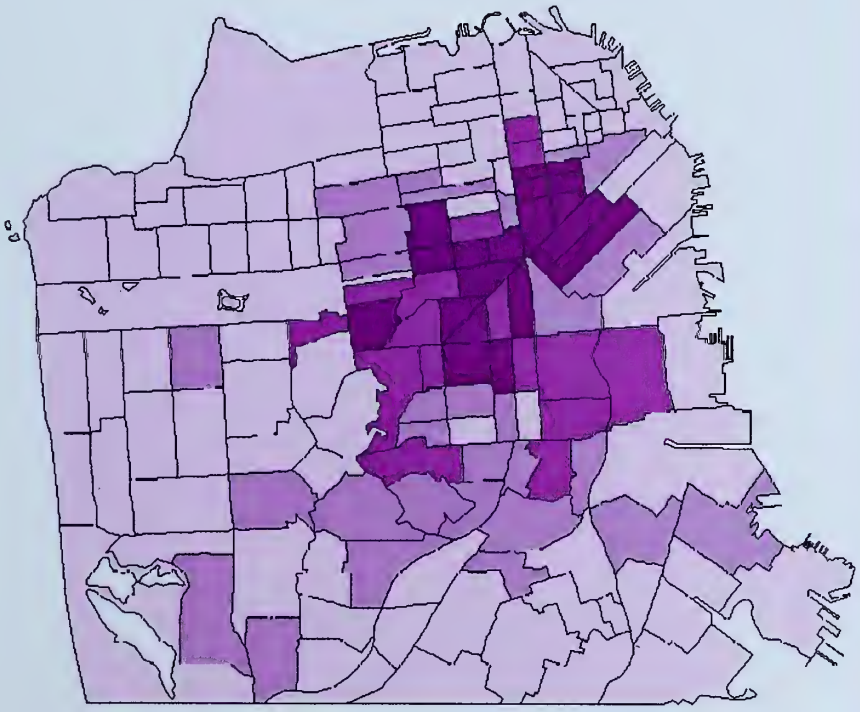
Legend

Number of Cases

- 61 to 245
- 25 to 60
- 11 to 24
- 0 to 10

1 inch = 1.2 miles

Distribution of Living AIDS Cases Among Men Who Have Sex With Men and Injection Drugs



City and County of San Francisco
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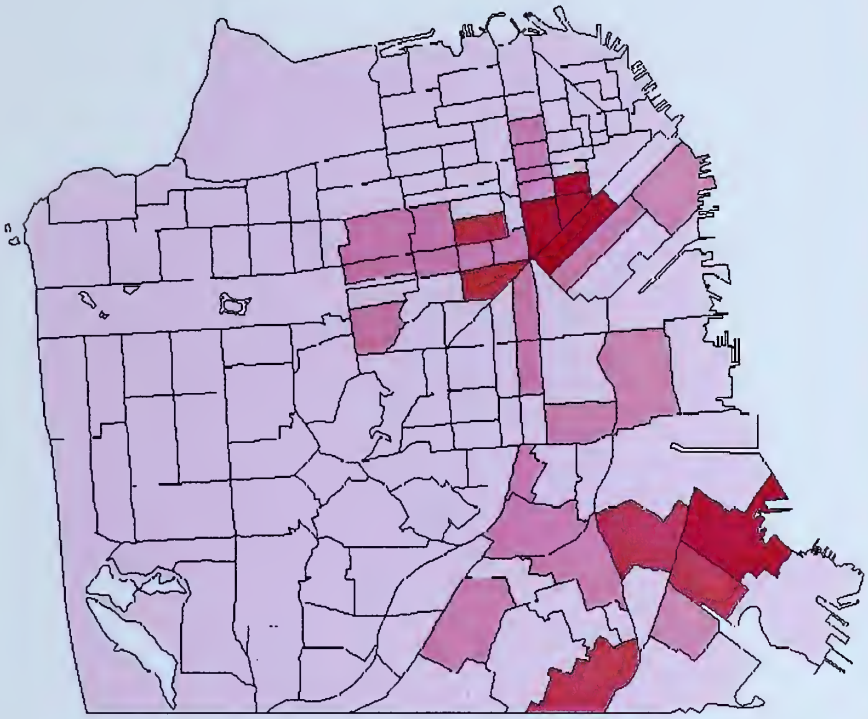
Legend

Number of Cases

- 11 to 59
- 6 to 10
- 3 to 5
- 0 to 2

1 inch = 1.2 miles

Distribution of Living AIDS Cases Among Heterosexual Injection Drug Users



City and County of San Francisco
2000

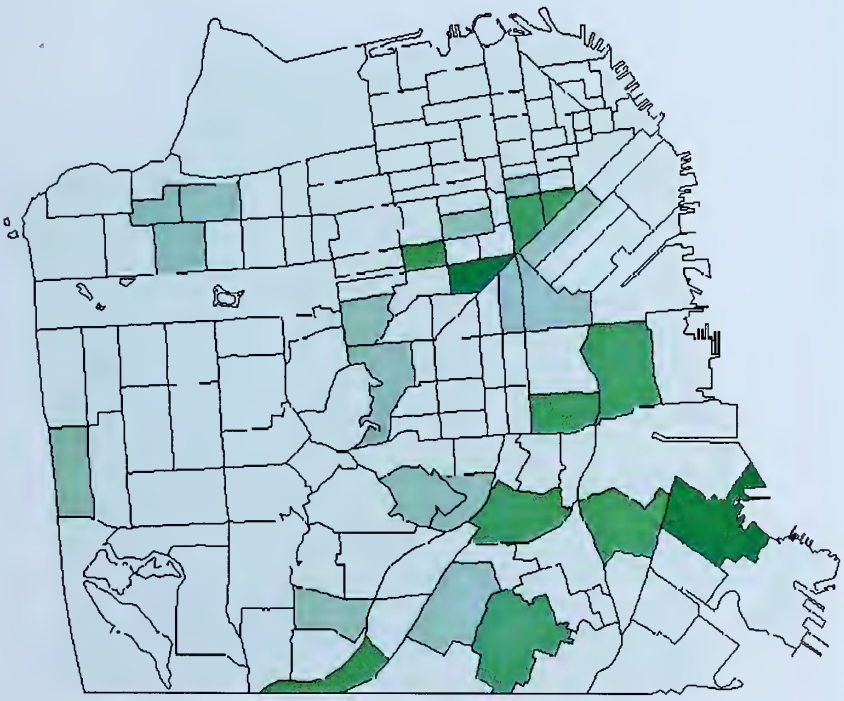
Legend

Number of Cases

- 18 to 36
- 11 to 17
- 4 to 10
- 0 to 3

1 inch = 1.2 miles

Distribution of Living AIDS Cases Among Heterosexuals (non-injection drug users)



City and County of San Francisco
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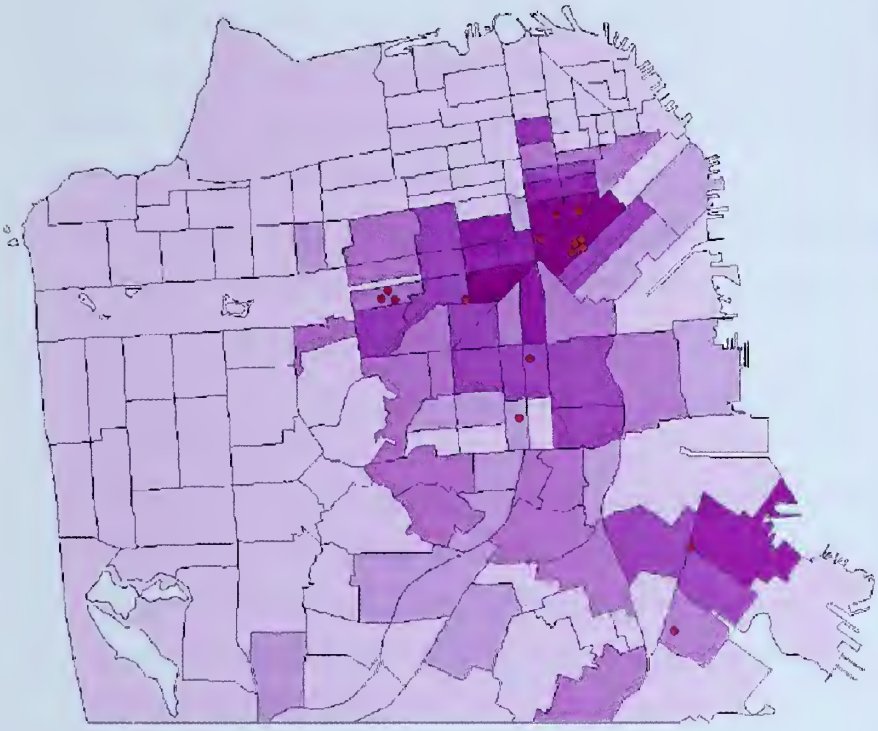
Legend

Number of Cases

- 18 to 36
- 11 to 17
- 4 to 10
- 0 to 3

1 inch = 1.2 miles

Living AIDS Cases Among Injection Drug Users and Publicly Funded Needle Exchange Locations



City and County of San Francisco
2000

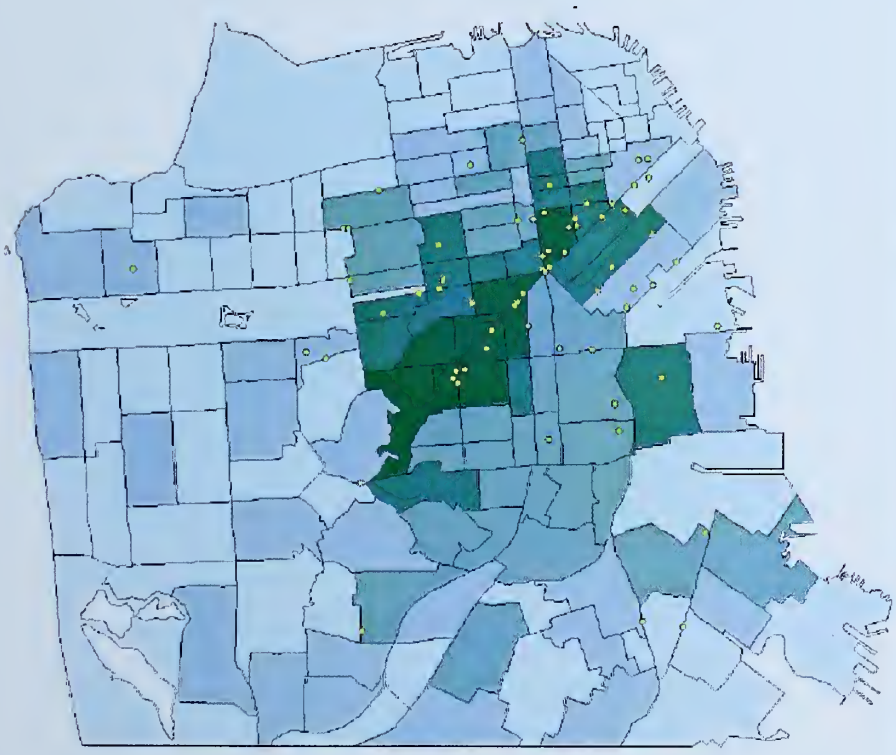
Legend

Number of Cases

- 43 to 82
- 23 to 42
- 13 to 22
- 7 to 12
- 4 to 6
- 0 to 3
- Needle exchange location

1 inch = 1.2 miles

Distribution of Living AIDS Cases and AIDS CARE Provider Locations



City and County of San Francisco
2000

Legend

Number of Cases

- 142 to 261
- 71 to 142
- 30 to 70
- 13 to 29
- 0 to 12
- = CARE location

1 inch = 1.2 miles

Discussion

- GIS characterized the spatial distribution of the HIV/AIDS epidemic in San Francisco, demarcating two epicenters (The Castro and Tenderloin) vastly different in demographic and environmental characteristics
- GIS was used to assess the concordance between the location of prevention and care services and the burden of infection
- Future GIS-based efforts include:
  - Mapping of recent HIV infection to identify the leading margins of sub-epidemics
  - Mapping of risk behavior, STDs, and markers of HIV transmission to identify "hot-spots" where transmission is occurring undetected
  - Efficient planning of prevention outreach
  - Efficient planning of population-based HIV prevalence and incidence studies